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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,641	02/12/2004	Pieter Klaas De Bokx	081468-0308135	1764
909	7590	11/15/2005	EXAMINER	
PILLSBURY WINTHROP SHAW PITTMAN, LLP			NGUYEN, HUNG	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2851	

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/776,641

Applicant(s)

DE BOKX ET AL.

Examiner

Hung Henry V. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 32 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-33 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/28/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of group I (claims 1-31) in the reply filed on October 4, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### ***Claim Objections***

2. Claim 28 is objected to because the claim is directed to a device (for example, substrate) made by the method of claim 23 but it is conceivable that the device as claimed can be made by another method (of the prior art) other than the method of claim 23. Hence, the claim does not further limit claim 23 as required by 35 U.S.C. 112, 4<sup>th</sup> paragraph. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 23-24 and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Piwezyk (U.S.Pat. 4,801,352).

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With respect to claims 1, 23-24, Piwezyk (figure 1) discloses a lithographic projection apparatus and corresponding method comprising all features of the instant claims such as: a radiation system constructed and arranged to supply a projection beam of radiation (see col.1, line 35, lines 50-55); a support structure for supporting a patterning device having a predetermined pattern formed therein (see col.1, lines 35-37); a substrate support (4) for supporting a substrate (2); a projection optical system (25) for projecting the pattern formed on the patterning device onto the substrate and a gas flushing system (24) comprising radial gas flow outlets (12-14) constructed and arranged to generate a radial gas flow through the radial gas flow outlets in an intermediate space defined between the gas flushing system and the substrate and wherein the radial gas flow has a radial velocity directed outwards in the space with a magnitude greater than zero at every location in the space (see col.5, lines 1-5; col.9, lines 20-30; col.10, lines 28-41).

With respect to claim 28, it is noted that the patentability of the product (device) does not depend on its method of production. If the product by the method/process claim is the same as or obvious from a product of the prior art, the burden shifts to the applicant to show an unobvious difference. (see *In re Mareosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al (U.S.Pat. 6,721,031) in view of Piwezyk (U.S.Pat. 4,801,352).

With respect to claims 1-4, 8, 18-31, Hasegawa et al (figure 1) discloses a lithographic projection apparatus and corresponding method comprising substantially all of the limitations of the instant claims such as: a radiation system having a wavelength of less than about 200 nm or a wavelength selected from the group consisting of between 152 nm and about 162 nm and between about 121 nm and about 131 nm (see col.7, lines 30-35); a support structure (321) constructed and arranged to support a patterning structure (322); a substrate support (304) for supporting a substrate (305); a projection system (302) constructed and arranged to project the patterned beam onto a target portion of the substrate; a gas flushing system constructed and arranged to generate an inert gas flow (such as Nitrogen, or Helium) through flow outlets in an intermediate spaced defined between the gas flushing system and the substrate wherein the gas flow has a velocity directed outwards in the space with a magnitude greater than zero at every location in the space (see col.7, lines 60-63). Hasegawa teaches outlet ports (117-118) and inlet ports (111-112) that are constructed and arranged to generate a substantially laminar gas flow across at least part of the projection beam between a last lens of the projection system and the substrate (see figures 13-17). Furthermore, Hasegawa (figure 17) teaches a lower lens element formed of a material substantially transparent to the radiation and a cover member (115 or 311) that is substantially planar and provided substantially parallel to the direction of the laminar flow to cover a non-planar surface of a component of the lithographic apparatus in or adjacent to the part of the beam. Hasegawa et al suggests that "the supply direction of inert gas by the air

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supply portion (112) is made parallel to the scanning direction (moving direction) of the wafer stage 102. The concentration distribution of inert gas perpendicular to the scanning direction can be made uniform” (see col.8, lines 54-59). Hasegawa does not expressly disclose the gas flushing system having radial gas flow outlets as recited in the instant claims of the present invention. Piwezyk discloses an exposure device (figures 1-2) having a gas flushing system with radial gas flow outlets (12-14) for generating a radial flow through the gas flow outlet in an intermediate space defined between the gas flushing system and the substrate (2). In view of such teachings, it would have been obvious to one having ordinary skill in the art to combine the teachings of Hasegawa and Piwezyk to obtain the invention as specified in the mentioned claims. It would have been obvious to a skilled artisan to employ the flushing system as taught by Piwezyk into the exposure system/method of Hasegawa for the purpose of generating the radial gas flow toward the space between the projection lens and the substrate. The purpose of doing so would have been to remove particles, gas debris on the surface of the substrate and thus to reduce the absorption of the projection beam light whereby the light transmission is increased and the quality of the images to be greatly improved.

With respect to claims 5-7, 9-17, Hasegawa as modified by Piwezyk, lacks to disclose the specified length of the intermediate space or the contamination of air as recited in the above claims. It would have been obvious to a skilled artisan to determine the length of the intermediate space and the concentration distribution of inert gas (for example, Hasegawa suggests that the distribution of the atmosphere in the optical path space 113 is desirably uniform at a ppm-level oxygen concentration (see col.10, lines 5-10)), as recited in the instant claims since it has been held that where the general conditions of a claims are disclosed in the prior art,

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discovering the optimum and workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

7. Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al (U.S.Pat. 6,721,031) in view of Gerhard et al (U.S.Pat. 6,936,825).

With respect to claims 1-4, 8, 18-31, Hasegawa et al (figure 1) discloses a lithographic projection apparatus and corresponding method comprising substantially all of the limitations of the instant claims such as: a radiation system having a wavelength of less than about 200 nm or a wavelength selected from the group consisting of between 152 nm and about 162 nm and between about 121 nm and about 131 nm (see col.7, lines 30-35); a support structure (321) constructed and arranged to support a patterning structure (322); a substrate support (304) for supporting a substrate (305); a projection system (302) constructed and arranged to project the patterned beam onto a target portion of the substrate; a gas flushing system constructed and arranged to generate an inert gas flow (such as Nitrogen, or Helium or Ar, Lr and Ne) through flow outlets in an intermediate spaced defined between the gas flushing system and the substrate wherein the gas flow has a velocity directed outwards in the space with a magnitude greater than zero at every location in the space (see col.7, lines 60-63). Hasegawa teaches outlet ports (117-118) and inlet ports (111-112) that are constructed and arranged to generate a substantially laminar gas flow across at least part of the projection beam between a last lens of the projection system and the substrate (see figures 13-17). Furthermore, Hasegawa (figure 17) teaches a lower lens element formed of a material substantially transparent to the radiation and a cover member (115 or 311) that is substantially planar and provided substantially parallel to the

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direction of the laminar flow to cover a non-planar surface of a component of the lithographic apparatus in or adjacent to the part of the beam. Hasegawa et al suggests that “the supply direction of inert gas by the air supply portion (112) is made parallel to the scanning direction (moving direction) of the wafer stage 102. The concentration distribution of inert gas perpendicular to the scanning direction can be made uniform” (see col.8, lines 54-59).

Hasegawa does not expressly disclose the gas flushing system having radial gas flow outlets as recited in the instant claims of the present invention. For contamination flushing of micro lithographic projection exposure devices with surfaces of optical elements, Gehard et al (figure 1) discloses an exposure device having a gas flushing system with radial gas flow outlets (8) for generating a radial flow over the lens surface. In view of such teachings, it would have been obvious to one having ordinary skill in the art to combine the teachings of Hasegawa and Gerhard et al to obtain the invention as specified in the mentioned claims. It would have been obvious to a skilled artisan to employ the flushing system as taught by Gerhard et al into the exposure system/method of Hasegawa for the purpose of generating the radial gas flow toward the space between the projection lens and the substrate for reducing the absorption of the projection beam light whereby the light transmission is increased and the quality of the images to be greatly improved.

With respect to claims 5-7, 9-17, Hasegawa as modified by Gerhard et al, lacks to disclose the specified length of the intermediate space or the contamination of air as recited in the above claims. It would have been obvious to a skilled artisan to select the length of the intermediate space and the concentration distribution of inert gas, as recited in the instant claims since it has been held that where the general conditions of a claims are disclosed in the prior art,



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discovering the optimum and workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

***Prior Art Made of Record***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Loopstra (U.S.Pat. 6,555,834); Van Empel (U.S.Pat. 6,933,513) and Hasegawa et al (U.S.Pat. 6,954,255) are cited for their teachings of immersion type exposure apparatuses.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V. Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

hvn  
11/9/05



HENRY HUNG NGUYEN  
PRIMARY EXAMINER